

AMENDED CLAIMS

[received by the International Bureau on 26 August 2005 (26.08.2005);
original claims 1-22 replaced by amended claims 1-9]

- [c1] A system for separating a water/hydrocarbons emulsion fluid into a recovered oil fluid and a purified water fluid, the water/hydrocarbons emulsion fluid comprising a continuous phase and a dispersed phase, the purified water fluid being essentially constituted of the continuous phase, the system comprising:
a vessel (38, 48) at an inlet of which the water/hydrocarbons emulsion fluid may flow;
one or more coalescing element (37a, 37b) made of Reusable Polymer Absorbent material, each coalescing element allowing to coalesce at least a portion of the dispersed phase from small droplets into large drops, said large drops being further detached from the coalescing element upon a flow of the emulsion fluid;
one or more separating and guiding means (33a, 33b, 43), each separating and guiding means being associated with one coalescing element and being disposed at an output of the associated coalescing element to guide said detached large drops for further recovery and having a structure that is adapted to allow the continuous phase to flow through the separating and guiding means.
- [c2] The system of claim 1, further comprising:
one or more bed (31a, 31b), each bed allowing to support one coalescing element (37a, 37b) made of Reusable Polymer Absorbent material;
one or more recovery outlet (39a, 39b), each recovery outlet allowing to recover the recovered fluid from large drops detached from one coalescing element (37a, 37b).
- [c3] The system of claim 1 or 2, wherein each separating and guiding means is substantially located at 10 millimeters of the associated coalescing element so as

to allow a burst of bubbles (41) of the continuous phase, the bubbles being surrounded by a film of the dispersed phase, and the bubbles being formed between the coalescing element and the separating and guiding means.

[c4] The system according to any one of claims 1 to 3, wherein each separating and guiding means comprises:

a plurality of plates (51) to intercept said detached large drops; wherein:

the plurality of plates (51) are made of an oleophilic material so that the intercepted large drops adhere to the plates;

the plurality of plates (51) have a diagonal orientation adapted for guiding the adhered large drops upward.

[c5] The system according to any one of claims 1 to 4, comprising at least two coalescing elements and further comprising one or more weir (74a, 74b), each weir being associated with one coalescing element, said weir being located along and at an upstream side of the associated coalescing element, and said weir allowing to prevent the detached large drops of an upstream coalescing element to flow through the associated coalescing element.

[c6] The system of claim 5, wherein each weir is located at an upper portion of the vessel.

[c7] A method for recovering from a water/hydrocarbons emulsion fluid a recovered oil fluid and a purified water fluid, the water/hydrocarbons emulsion fluid comprising a continuous phase and a dispersed phase, the purified water fluid being essentially constituted of the continuous phase, the method comprising :
providing a flow of at least a portion of the water/hydrocarbons emulsion fluid through at least one bed (31a, 31b) within a vessel (38, 48), each bed supporting a coalescing element (37a, 37b) made of Reusable Polymer

Absorbent material, whereby at least a portion of the dispersed phase coalesces from small droplets into large drops;
detaching said large drops from each bed (31a, 31b) by means of a flow velocity;
guiding the detached large drops with at least one separating and guiding means (33a, 33b, 43), the at least one separating and guiding means being associated with the at least one bed (31a, 31b), said separating and guiding means having a structure that is adapted to allow the continuous phase to flow through the separator packing;
recovering the recovered oil fluid from the guided large drops; and
recovering the purified water fluid from the continuous phase.

[c8] The method of claim 7, further comprising: repeating the coalescing, the detaching, the guiding and the recovering steps at a further location of the vessel (38, 48).

[c9] The method of claim 7 or 8, further comprising:
intercepting the detached large drops with at least one plate (51) of the separating and guiding means, the large drops adhering onto the at least one plate;
guiding the adhered large drops along the at least one plate (51) upon a flow velocity.